

ABSTRACT OF THE DISCLOSURE

A process for prereforming natural gas containing higher hydrocarbons and methane, includes providing a reactor having a nickel catalyst; providing steam, hydrogen, and natural gas containing higher hydrocarbons and methane to the reactor; adding an oxidant to the feedstock, wherein the oxidant provides oxygen in an amount less than the amount required to partially oxidize all higher hydrocarbons to a mixture of carbon monoxide and hydrogen; reacting the oxidant with higher hydrocarbons; and forming a gaseous mixture containing methane, carbon monoxide, carbon dioxide, steam and hydrogen substantially free of higher hydrocarbons and oxygen. The gaseous mixture can be reformed. An apparatus for performing the process includes a reactor; a feedstock source containing steam, hydrogen, and natural gas comprising higher hydrocarbons and methane; an oxidant source; valves and pipes connecting the natural gas source, the oxidant source and the reactor; and a nickel-containing catalyst within the reactor.